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INTEGRATED CORDED SYSTEM CONNECTOR FOR A WIRELESS COMMUNICATIONS DEVICE

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INTEGRATED CORDED SYSTEM CONNECTOR FOR A WIRELESS COMMUNICATIONS DEVICE

BACKGROUND

The present invention relates generally to peripheral devices, and in particular, to peripheral devices for wireless communications devices.

Consumers have come to demand more functionality from their wireless communications devices than just simple two-way communications ability. Indeed, an entire market has evolved around the manufacture and sale of various accessories for wireless communications devices. For example, consumers can now purchase accessories such as battery chargers, hands-fee headsets, MP3 players, external cameras and flashes, and cables that permit users to upload/download data to/from the wireless communications device.

Some accessories have a cord with a plug on one end that mates with a system connector on the wireless communications device. When the user wishes to use the particular accessory, he or she simply plugs the accessory into the system connector. In many prior art devices, a problem arises when a user desires to use one or more accessories simultaneously. Some accessories use the entire system connector thereby preventing the use of a second accessory at the same time. Thus, users are often faced with the dilemma of either listening to an external MP3 player, for example, or conversing with a remote party using a hands-free headset. Further, the many cords may become tangled. What is needed is a device that permits users to use more than one accessory with their wireless communications device, as well as a way to eliminate the need to have a plurality of cords.

SUMMARY

An accessory for a wireless communications device comprises a first peripheral device, a system plug that mates with a system connector on the wireless

communications device, and a cord electrically connecting the first peripheral device with the system plug. An auxiliary system connector integrally formed with the cord provides a connection for a second peripheral device without the need to remove the first peripheral device from the system connector.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates one embodiment of the present invention.

Figure 2 illustrates a possible pin-out diagram for one embodiment of the present invention.

Figure 3 illustrates an alternate embodiment of the present invention.

DETAILED DESCRIPTION

Referring now to Figure 1, one embodiment of the present invention is shown therein and generally referenced by the number 10. The embodiment of Figure 1 illustrates a corded accessory with an integrated system corded connector. The corded accessory 10 comprises a first peripheral device 12, a system plug 14, a cord 16 interconnecting first peripheral device 12 and system plug 14, and an auxiliary system connector 18. The auxiliary system connector 18 is integrally formed with cord 16, and as described later in more detail, permits the connection of a second peripheral device 24. A switch 20 on the housing of the auxiliary system connector 18 allows a user of the corded accessory 10 to switch between first peripheral device 12 and second peripheral device 24.

As seen in Figure 1, first peripheral device 12 may comprise a hands-free headset that includes a speaker 12a and a microphone 12b. However, those skilled in the art will readily appreciate that the depiction of first peripheral device 12 in Figure 1 as a hands-free headset is merely illustrative. First peripheral device 12 may also be some

other accessory, such as a battery charger or an MP3 player, or it may be a separate device such as a Personal Digital Assistant (PDA) or a personal computing device.

The system plug 14 mates with the system interface connector 32 of wireless communications device 30. Typically, system plug 14 is a "male" type connector that plugs into a corresponding "female" type system interface connector 32. However, alternate embodiments contemplate system plug 14 as a "female" type connector that plugs into a corresponding "male" type system interface connector 32.

Cord 16 interconnects first peripheral device 12 and system plug 14. Typically, cord 16 contains one or more electrical conductors, such as copper wires that serve as an electrical pathway between first peripheral device 12 and wireless communications device 30. Cord 16 preferably includes an outer sheath to insulate and protect the electrical conductors contained within the sheath.

The auxiliary system connector 18 is integrated into the cord 16, and mates with a system plug 22 of second peripheral device 24. As seen in the Figures, auxiliary system connector 16 may be enclosed inside a molded protective housing made of plastic or some other suitable material. The electrical conductors that interconnect first peripheral device 12 to system plug 14 also interconnect auxiliary system connector 18 to system plug 14. This provides an electrical pathway between auxiliary system connector 18 and wireless communications device 30, thereby permitting the user electrically connect the second peripheral device 24 to the wireless communications device without first having to remove or unplug first peripheral device 12 from system interface connector 32.

In use, the user connects the system plug 14 of corded accessory 10 to the system interface connector 32 of wireless communications device 30. This makes an electrical connection between the wireless communications device 30 and first peripheral device 12. In this example, first peripheral device 12 is a hands-free headset,

which allows the user to pursue other activities, such as driving a car, while engaging in a conversation with a remote party. However, the user may also wish to listen to music stored in an MP3 player, exemplified in Figure 1 by second peripheral device 24, when the user is not engaged in conversation. Thus, the user simply connects system plug 22 of second peripheral device 24 into auxiliary system connector 18 to establish a second electrical connection between the second peripheral device 24 and the wireless communications device 30. The user may now engage in a conversation with a remote party and/or listen to music without having to connect and disconnect first peripheral device 12 and second peripheral device 24 from system interface connector 32.

First peripheral device 12 and second peripheral device 24 may or may not share some common signals sent to/received from wireless communications device 30. For example, first peripheral device 12 and second peripheral device 24 may receive audio on the same audio-out line from wireless communications device 30. A similar circumstance may occur for power and audio-in lines. Likewise, other signals may or may not be shared. In these embodiments, switch 20 permits a user to selectively switch signal paths between first peripheral device 12 and second peripheral device 24.

Switch 20 may comprise, but is not limited to, optical switches, electrical switches, mechanical switches, or multi-way switches, for example. One embodiment of the present invention includes a 2-way mechanical rocker switch that permits the user to selectively alternate audio between first peripheral device 12 and second peripheral device 24. Thus, the user can operate switch 20 to ensure that only one of the first and second peripheral devices 12, 24 receive audio on the audio-out line, send audio on the audio-in line, or receive power from the wireless communications device 30. Alternatively, switch 20 may also be configured to allow both first and second peripheral devices 12, 24 to send and/or receive audio, as well as power.

In another embodiment of the present invention, switch 20 may include circuitry to automatically detect the presence (or lack of presence) of one or more peripheral devices connected to auxiliary system connector 18. The circuitry may be positioned in the auxiliary system connector 18, for example. The circuitry could automatically detect the type of peripheral device or devices connected to the auxiliary system connector 18, and control the transmission paths of the signals to/from first and second peripheral devices 12, 24 based on the type of peripherals it detects. An alternate embodiment utilizes a microprocessor or other circuitry within the wireless communications device 30 to automatically detect the type of peripheral device or devices connected to the auxiliary system connector 18. In this embodiment, the microprocessor sends control signals to the auxiliary system connector 18 to control the switch configuration. For example, a user listening to an MP3 player may want to be interrupted to receive an incoming call. In these cases, the microprocessor would automatically switch the audio-out path from the MP3 player to the wireless communications device 30. The user can then communicate using a hands-free headset.

Those skilled in the art will realize that the functionality to distinguish between accessories and control the signaling paths accordingly may conceivably be encompassed in software programming and/or hardware. Of course, switch 20 may not be included at all. Further, the specifics of switch 20 and its operation will invariably depend upon; *inter alia*, factors such as connector configuration and available functionality.

Auxiliary connector 18 may be wired to system plug 14 in any number of ways. For example, the wiring may be straight through, or may be more complex, depending on how the systems interface connector 32 and/or the auxiliary connector 18 is configured. In Figure 2, for example, the pins on system plug 14 are wired through switch 20 to auxiliary connector 18 and first peripheral device 12. As stated above,

switch 20 may comprise circuitry to automatically detect signals along the wires, or may be circuitry that is controlled by the microprocessor within the wireless communications device 30. Other configurations are also possible. While this illustrates a simplistic embodiment, those skilled in the art will understand that a virtually limitless number of ways exist in which to wire the connections between system plug 14 and auxiliary system connector 18.

The number of accessories that may be connected in the present invention is limited only by the number of available pins in auxiliary system connector 18. For example, Figure 3 illustrates one embodiment where system plug 22 of second peripheral device 24 all the pins that are available in auxiliary system connector 18. Thus, a third peripheral device 26 having a system plug 28 may be connected simultaneously with second peripheral device 24 to the same auxiliary system connector 18. Additionally, corded accessory 10 may include a plurality of auxiliary system connectors 18 integrally formed with cord 16. Each auxiliary system connector 18 may permit the connection of one or more peripheral devices.

The present invention may, of course, be carried out in other ways than those specifically set forth herein without departing from essential characteristics of the invention. The present embodiments are to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.